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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,686	09/30/2003	Gundrala D. Goud	42P17238	5119
7590	06/14/2007		EXAMINER	
Anthony H. Azure BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP Seventh Floor 12400 Wilshire Boulevard Los Angeles, CA 90025			KAW SAR, ABDULLAH AL	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/674,686	GOUD ET AL.
	Examiner	Art Unit
	Abdullah-Al Kawsar	2109

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 September 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-29 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 September 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/30/2003</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

1. Claims 1- 29 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being unclear and indefinite to particularly the subject matter which applicant regards as the invention. Claim 22 recites, "*VM switch from the service OS to the service OS*" which is unclear to the claimed subject matter, appropriate correction is required. Examiner interprets the claim request as vm switch from the service os to the guest os.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 7-11, 13, 14, 16, 17, 19, 20, 22-24, 26 and 27 are rejected under 35 U.S.C. 103(a) being unpatentable over Inoue et al (Inoue) US Patent No. 5,437033 in view of “Virtualizing I/O Devices on VMware Workstation’s Hosted Virtual Machine Monitor”(Sugerman).

As per claim 1, Sugerman discloses:

- loading a virtual machine monitor (VMM) to support a service virtual machine (VM) and a guest VM of a computer system; (page 2 col 2 lines 21-23, “hosted architecture that allows it to co-exist with a pre-existing host operating system, and rely upon that operating system for device support” and page 3 col 1 lines 34-37, “the CPU virtualization is handled by the VMM. A guest application or operating system performing pure computation runs just like a traditional mainframe-style virtual machine system”) the host operating system is the service operating system.

- invoking a service operating system (OS) in the service VM during the pre-boot phase of the computer system, the service OS to allow observation of a guest OS (page 1 col 2 lines 15-17, “the monitor gets out of the way whenever possible and allows the virtual machine to execute directly on the hardware”), allowing the virtual machine execute directly on the hardware means allowing the a service vm during pre-boot phase. .

- invoking the guest OS in the guest VM (page 2 col 1 lines 7-8 “The operating systems that run in virtual machines are termed guest operating systems”)

However Sugerman does not disclose, *switching between the guest VM and the service VM during an OS runtime.*

On the other hand Inoue discloses:

- *switching between the guest VM and the service VM during an OS runtime of the guest OS* (col 1 lines 46-48, “Switching from the non-guest mode to the guest mode is performed by issuing a start interpretive execution instruction”) non-guest mode is the service os of the system.

Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Inoue into the method of Sugerman to switch between guest vm and service vm during runtime. The modification would have been obvious because one of the ordinary skills of the art would want to switch between different vm for better system efficiency.

As per claim 2, the rejection of claim 1 incorporates and further Sugerman discloses:

- *wherein the VMM to operate in accordance with instructions stored in a non-volatile storage device of the computer system* (page 3 col 1 lines 26-27, “virtual machine monitor component (VMM) that runs directly on the hardware”) hardware storage is non-volatile storage.

As per claim 3, the rejection of claim 1 incorporates and further Inoue discloses:

- *further comprising switching from the guest VM to the service VM in response to a trap event, wherein the trap event includes detecting a violation of a policy of the computer system by the VMM.* (col 3 lines 1-2, “If a failure occurs due to a program error in the virtual

machine monitor” and col 3 lines 7-9, “one operating system on the virtual machine which is operated in the guest mode is changed to the non-guest mode and is operated.), changing a guest to the non-guest mode means to operate that guest in as a service vm.

As per claim 5, the rejection of claim 1 incorporates and further Inoue discloses:

- periodically checking for a fault condition of the guest OS by the VMM; and switching to the service VM if the VMM detects the fault condition. (col 2 lines 61-66, “Means for detecting the occurrence of a failure due to a program error is provided in a processor. The module for dispatching the continuous guest in the main storage is started in response to the detection of the failure by failure occurrence detecting means.”).

As per claim 7, the rejection of claim 1 incorporates and further Inoue discloses:

- unloading the VMM and executing the guest OS in a non-virtual machine environment of the computer system. (col 3 lines 6-10, “The virtual machine monitor is dumped and one operating system on the virtual machine which is operated in the guest mode is changed to the nonguest mode and is operated.”).

As per claim 8, the rejection of claim 1 incorporates and further Sugerman discloses:

- wherein the VMM is loaded during the pre-boot phase of the computer system. (page 1 col 2 lines 8-14, “A software layer called a virtual machine monitor (VMM) takes complete control of the machine hardware and creates virtual machines, each of which behaves like a complete physical machine that can run its own operating system (OS.”).

As per claim 9, the rejection of claim 1 incorporates and further Inoue discloses:

- wherein invoking the guest OS is initiated by a switch from the service VM. (col 1 lines 46-48, “Switching from the non-guest mode to the guest mode is performed by issuing a start interpretive execution instruction”) non-guest mode is the service os of the system.

As per claim 10, the rejection of claim 1 incorporates and further Inoue discloses:

- wherein switching between the guest VM and the service VM is completed without rebooting the computer system. (col 2 lines 20-25, “continuous operation of a computer system, which is capable of continuing in the nonguest mode the operation of the OS which has been operated in the guest mode without pending an interruption by a virtual machine monitor and the hypervisor.”), operations between vm without interrupting the vmm is switching between VMs without rebooting the computer system.

As per claim 11, the rejection of claim 1 incorporates and further Inoue discloses:

- wherein switching between the guest VM and the service VM is performed by firmware of the computer system. (Col 9 lines 58-62, “the dedication of the input/output interruption subclass and the instruction processor to the continuous guest causes all the input/output interruption relating to the guest in interest to be directly executed without being held in the virtual machine monitor”) instruction processor is the firmware with instruction that performs the switch between VM.

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Claim 13 is a process claim of claim 1 above. It is therefore rejected under the same rational.

Claim 22 is a system with executable program code of combined method of claims 1 and 3 above. It is therefore rejected under the same rational.

Claims 16 and 23 are process and system claims of claim 3 above. They are therefore rejected under the same rational.

Claim 17 is a process claim of claim 5 above. It is therefore rejected under the same rational.

Claim 14 is a process claim of claim 9 above. It is therefore rejected under the same rational.

Claim 27 is a process claim of claim 10 above. It is therefore rejected under the same rational.

Claim 20 is a process claim of claim 11 above. It is therefore rejected under the same rational.

Claims 19 and 26 are process and system claims of claim 7 above. They are therefore rejected under the same rational.

6. Claims 6, 12, 15, 18, 21, 25, 28 and 29 are rejected under 35 U.S.C. 103(a) being unpatentable over Inoue et al (Inoue) US Patent No. 5,437033 in view of “Virtualizing I/O Devices on VMware Workstation’s Hosted Virtual Machine Monitor” (Sugerman) and in view of “Logical Partition Security in the IBM eServer pSeries 690”(IBM).

As per claim 6 Inoue in view of Sugerman discloses all the elements of claim 6 except, *switching to the service VM from the guest VM in response to a user request.*

On the other hand IBM discloses:

- further comprising switching to the service VM from the guest VM in response to a user request. (page 1 col 1 lines 6-10 “Logical partitioning (LPAR) is a server design feature that provides more end-user flexibility by making it possible to run multiple, independent operating system images concurrently on a single server.”) end user flexibility to concurrently running multiple OS means user requested switching between operating systems as claimed.

Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of IBM into the combined method of Inoue and Sugerman to switch between OS in response of user request. The modification would have been obvious because one of the ordinary skills of the art would want to have the user in control of the guest OS and have the ability to switch between the service and guest to check on the system health and diagnose at any given time for precaution.

As per claim 12, the rejection of claim 1 incorporates and further IBM discloses:

- wherein operations of the VMM are assisted by microcode of a processor of the computer system. (page 2 col 2 lines 17-21, “The register that provides a processor the physical address of its page table is also protected by hardware logic, so that it cannot be modified by partition programs, and can only be modified by the hypervisor.”).

As per claim 15, the rejection of claim 13 incorporates and further IBM discloses:

- wherein the VMM to operate in accordance with an Extensible Firmware Interface (EFI) framework standard. (page 1 col 2 lines 23-27 “When each partition is started, firmware assigns that partition a unique real mode address offset and range value, and then sets these offset and range values into registers in each processor in the partition.”) firmware is the extensible firmware interface.

Claims 18 and 25 are process and system claims of claim 6 above. They are therefore rejected under the same rational.

Claims 21 and 28 are process and system claims of claim 12 above. They are therefore rejected under the same rational.

Claim 29 is a system claim of claim 15 above. It is therefore rejected under the same rational.

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7. Claims 4 and 24 are rejected under 35 U.S.C. 103(a) being unpatentable over Inoue et al (Inoue) US Patent No. 5,437033 in view of “Virtualizing I/O Devices on VMware Workstation’s Hosted Virtual Machine Monitor”(Sugerman) and in view of “Scale and Performance in the Denali Isolation Kernel” (Denali).

As per claim 4 Inoue in view of Sugerman discloses all the elements of claim 4 except, *comprising setting the policy of the trap event during the pre-boot phase.*

On the other hand Denali discloses:

- further comprising setting the policy of the trap event during the pre-boot phase of the computer system. (page 4 col 1 lines 48-51 “maintained a strict separation between resource management policy and mechanism, so that we could implement different policies without affecting other aspects of the isolation kernel.”)

Therefore, it would have been obvious to a person of ordinary skill in art at the time of invention was made to incorporate the teaching of Denali into the combined method of Inoue and Sugerman to set the policy during the pre-boot phase of the machine. The modification would have been obvious because one of the ordinary skills of the art would want to have the policy in the pre-boot phase for more secure and flawless monitoring and also it would have been easy to modify the policy settings.

Claim 24 is a system with executable program code of combined method of claims 3 and 4 above. It is therefore rejected under the same rational.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

TITLE: System for recovery from a virtual machine monitor failure with a continuous guest dispatched to a nonguest mode, US Patent No. 5,437,033.

TITLE: Virtualizing I/O Devices on VMware Workstation's Hosted Virtual Machine Monitor;
Jeremy Sugerman, Ganesh Venkitachalam and Beng-Hong Lim; Proceedings of the 2001
USENIX Annual Technical Conference

TITLE: Logical Partition Security in the IBM eServer pSeries 690, IBM 2002.

TITLE: Scale and Performance in the Denali Isolation Kernel, ACM SIGOPS Operating Systems
Review, 2002.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdullah-Al Kawsar whose telephone number is 571-270-3169. The examiner can normally be reached on 7:30am to 5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chameli Das can be reached on 571-270-1392. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AK

Chameli Das
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SUPERVISORY PATENT EXAMINER

6/11/07